REMARKS

This amendment responds to the office action mailed July 8, 2009. In the office action the Examiner:

- rejected claims 1, 3-4, 13, 15, 16, 25, 27-28, 37, 39, 41, 43, 45, and 47 under 35 U.S.C. 103(a) as being unpatentable over Matsuda (US 2003/0225779) in view of Parkes ("Introduction to Languages, Machines and Logic," 2002);
- rejected claims 5, 17 and 29 under 35 U.S.C. 103(a) as being unpatentable over Matsuda in view of Parkes and further in view of Lewak et al. (US 6,826,566);
- rejected claims 6, 18, 30, 38, 42 and 46 under 35 U.S.C. 103(a) as being unpatentable over Matsuda in view of Parkes and further in view of Burrows (6,021.409); and
- rejected claims 40, 44, 48 under 35 U.S.C. 103(a) as being unpatentable over Matsuda (US 2003/0225779) in view of Parkes and further in view of Beavin et al. (US 6,571, 233).

After entry of this amendment, the pending claims are: claims 1, 3-6, 13, 15-18, 25, 27-30, and 37-48.

35 U.S.C. §103(a)

Claims 1, 3-4, 13, 15, 16, 25, 27-28, 37, 39, 41, 43, 45, and 47

As described in more detail below, Matsuda and Parkes do not disclose at least the following aspects of Claim 1:

> receiving a number-range search query having a number range, wherein the number range includes a boundary number;
> generating an expression of numerical index terms based on the boundary number, wherein a respective numerical index term in the expression includes information indicative of an integral portion of a logarithm of the boundary number;
> searching a document index of the search engine using the expression to identify one or more documents containing numbers that satisfy the expression; and
> returning a result in accordance with at least a subset of the identified documents.
> (emphasis added)

Claim 1 requires, when "generating an expression" to be used when "searching a document index," that "a respective numerical index term in the expression includes information indicative of an integral portion of a logarithm of the boundary number."

For example, for the boundary number 727.1, the integral portion of a logarithm of the boundary number is 2 in base 10 (i.e., $\log_{10} 727.1 \cong 2.86$) Note that the expression of numerical index terms can also include the digits of the boundary number, which are the quotients of the boundary number divided by successive powers of the base. For example, for the boundary number 727.1, the digits are 7, 2, 7, 1 in base 10. Thus, the numerical index terms for the boundary number 727.1 can be represented as:

numrange_characteristic_2
numrange_digit_0_7
numrange_digit_1_2
numrange_digit_2_7
numrange_digit_3_1_end

The term **numrange_characteristic_2** indicates that an integral portion of a logarithm of the boundary number is 2. The term numrange_digit_0_7 indicates that the first digit of the boundary number is 7. The term numrange_digit_1_2 indicates that the second digit of the boundary number is 2. The term numrange_digit_2_7 indicates that the third digit of the boundary number is 7. The term numrange_digit_3_1_end indicates that the last digit of the boundary number is 1. Note that the "integral portion of a logarithm of the boundary number" indicates where the decimal point for the boundary number should be placed. In this example, since the integral portion of the logarithm of the boundary number is 2, the decimal point is located after the third digit (e.g., between the 7 and the 1).

The Examiner correctly states that Matsuda does not disclose "wherein a respective numerical index term in the expression includes information indicative of an integral portion of a logarithm of the boundary number" (see pages 3-4 of the Office Action dated July 8, 2009). However, the Examiner is incorrect in stating that Parkes pages 259-261 disclose this aspect of Claim 1. Parkes is directed to estimating the runtime of a binary search (see Parkes page 258). As is well known, the runtime of a binary search is $O(\log_2 n)$. Parkes pages 259-261 merely disclose the basic mathematical principle of calculating logarithms. For example, Parkes discloses that the value of $\log_{10} 523$ is between 2 and 3. However,

Parkes does not disclose including, in an expression to be used when searching a document index, an integral portion of a logarithm of the boundary number a respective index term in a number-range search query. In other words, Parkes does not disclose the specific use of the logarithm, as required by Claim 1.

For at least the reasons noted above, Claim 1 and its dependents are patentable over Matsuda and Parkes. Furthermore, Claims 13, 25, and their dependents are patentable over Matsuda and Parkes for at least the reasons noted above with respect to Claim 1. Applicants respectfully request that this rejection be withdrawn.

35 U.S.C. §103(a)

Claims 5, 17 and 29

Claims 5, 17, and 29 depend on Claim 1, 13, and 25, respectively. Therefore, dependent Claims 5, 17, and 29 include each and every limitation of independent Claims 1, 13, and 25, respectively. As discussed above Matsuda and Parkes do not teach all of the claim limitations of independent Claims 1, 13, and 25. Lewak is not cited for and does not teach the missing limitations. Because Matsuda, Parkes, and Lewak, either alone or in combination, do not teach at least these claim limitations (i.e., of the independent claims), there is no prima facie case of obviousness for Claims 1, 13, and 25 and associated dependent claims 5, 17, and 29. Applicants respectfully request that this rejection be withdrawn.

35 U.S.C. §103(a)

Claims 6, 18, 30, 38, 42 and 46

Claims 6 and 38, 18 and 42, and 30 and 46 depend on Claim 1, 13, and 25, respectively. Therefore, dependent Claims 6 and 38, 18 and 42, and 30 and 46 include each and every limitation of independent Claims 1, 13, and 25, respectively. As discussed above Matsuda and Parkes do not teach all of the claim limitations of independent Claims 1, 13, and 25. Burrows is not cited for and does not teach the missing limitations. Because Matsuda, Parkes, and Burrows, either alone or in combination, do not teach at least these claim limitations (i.e., of the independent claims), there is no prima facie case of obviousness for Claims 1, 13, and 25 and associated dependent claims 6 and 38, 18 and 42, and 30 and 46. Applicants respectfully request that this rejection be withdrawn.

35 U.S.C. §103(a)

Claims 40, 44, and 48

Claims 40, 44, and 48 depend on Claim 1, 13, and 25, respectively. Therefore, dependent Claims 40, 44, and 48 include each and every limitation of independent Claims 1, 13, and 25, respectively. As discussed above Matsuda and Parkes do not teach all of the claim limitations of independent Claims 1, 13, and 25. Beavin is not cited for and does not teach the missing limitations. Because Matsuda, Parkes, and Beavin, either alone or in combination, do not teach at least these claim limitations (i.e., of the independent claims), there is no prima facie case of obviousness for Claims 1, 13, and 25 and associated dependent claims 40, 44, and 48. Applicants respectfully request that this rejection be withdrawn.

In light of the above amendments and remarks, the Applicant respectfully requests that the Examiner reconsider this application with a view towards allowance. The Examiner is invited to call the undersigned attorney at (650) 843-4000, if a telephone call could help resolve any remaining items.

Respectfully submitted,

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/ Gary S. Williams / 31,066

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